MODELLING THE ERROR EFFECT WITHIN IKONOS GEO - CARTERRA™ IMAGERY: TOWARDS ACCURATE MAP GENERATION

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ABSTRACT

IKONOS GEOCARTERRA™ imagery from Space Imaging is one of the finest line of products of the high-resolution imagery exist within the market. While this imagery is optimum for the map layers updating and generation it has some commercial restrictions. In order to use the IKONOS imagery in general for mapping purpose, the client should obtain the highest accuracy image (the orthorectified product). Orthorectified IKONOS imagery is 5 to 8 times more expensive than the partially rectified GEO products. IKONOS GEOCARTERRA™ is the product with the lowest rectification level among this satellite’s line of products, possessing a circular error CE 90% of 50 meters excluding the relief displacement. This paper presents and outlines a new technique that will help in using the cheap IKONOS GEOCARTERRA™ imagery in generating map layers (building map layers for example) without the need to buy the orthorectified one with a reasonable high accuracy. This technique involves a process that takes the IKONOS GEOCARTERRA™ feature image pixel coordinates and performs a multi-stage orthorectification procedure to eliminate the existing errors and distortions to produce the correct corresponding ground coordinates. This technique resulted on a new model representing the final correct ground coordinates as a function of the image pixel coordinates and image parameters is developed. When tested, the developed model provided approximately the same level of positional accuracy as the IKONOS orthorectified products.

Keywords: IKONOS, Orthorectification, Remote Sensing, Transformation